

## **REMARKS**

Claims 1-7, 9, 11, 12, 14-23 and 25-27 are now pending in the application. Claims 1-27 stand rejected. Claims 8, 10, 13, 24 and 28 have been cancelled herein; and Claims 1, 2, 3, 9, 11, 12, 15, 16, 20 and 23 have been amended. Claim 29 is new. Bases for the amendments, and the new claim, can be found throughout the application, drawings and claims. The Examiner is respectfully requested to reconsider and withdraw the rejections in view of the amendments and remarks contained herein.

## **CLAIM AMENDMENTS**

The claims are presently amended to further clarify the presently pending claims for consideration and to correct minor informalities. The present amendments to the claims clarify the various elements of the claims previously presented and are in line with the Applicants' previous arguments and amendments. Thus, the amendments to the claims herein do not require a new search.

## **REJECTION UNDER 35 U.S.C. § 102**

Claims 1, 2, 4, 6-8, 10, 12, 13, 15, 17-19, 21 are rejected under 35 § 102(b) as being anticipated by Pavlidis (U.S. 6,854,879; hereinafter "Pavlidis"). This rejection is respectfully traversed.

At the outset, Applicants note Pavlidis teaches the use of human skin emissions to determine whether a person is lying. In contrast, independent Claim 1 has been amended to recite:

a camera for producing an image of a portion of the subject, the image being comprised at least in part from a

either a first spectral reflection of light from skin of the subject when the subject is not experiencing stress, or a second spectral reflection of light when the subject is experiencing stress, the second spectral reflection of light resulting from increased sub-dermal blood flow and increased dermal hydration of the subject; and

a processor adapted to receive said image and to compare the image to a base line reflectance spectrum to determine if said image has been created by said first spectral reflection of light or said second spectral reflection of light, to determine if said subject is experiencing stress or is unstressed (emphasis added).

Independent Claim 12 has been amended to recite:

observing an image of the subject, the image of the subject being comprised of a first spectral reflection when the subject is not experiencing stress, and a second spectral reflection when the subject is stressed, the second spectral reflection being caused by an increase in sub-dermal blood flow and an increase in dermal hydration of the subject indicating a skin blush of the subject;

\* \* \*

analyzing the image against a base line reflectance spectrum to determine whether the image represents said first or said second spectral reflection, to thus determine if said subject is experiencing stress (emphasis added).

Applicants respectfully assert that these features as claimed are not taught, disclosed, or suggested by Pavlidis.

At best, Pavlidis appears to disclose a system for polygraph testing that converts a thermal facial image of an individual 30 into a visualization of blood flow rate in the person's face to determine during the polygraph testing if the person is lying (see at least Column 5, Lines 51-65 and Column 6, Lines 36-45). The system of Pavlidis is based purely on thermal energy that is emitted from the person and not a spectral reflection of light from the person. Pavlidis does not teach or disclose whatsoever

determining physiological stress based on spectral reflections, or spectral reflections that comprise a spectrum of subdermal blood flow and subdermal hydration as claimed. It would be improper to modify Pavlidis to arrive at Applicants' claims herein, as there is no suggestion in Pavlidis to use spectrum reflections whatsoever, or to determine a blush based on spectral reflections that include subdermal hydration.

Furthermore, Pavlidis teaches away from the claimed subject matter, as Pavlidis teaches a cooling of the cheeks in response to stimulus and measuring the blood flow temperature change in the cheeks and the periorbital region 34 around the eyes 35 to determine if the individual 30 is anxious (see at least Column 5, lines 52-65). As is known in the art, a blush is characterized by an increase in subdermal blood flow to the cheeks, or a warming of the cheeks, and not a decrease in subdermal blood flow, or a cooling of the cheeks. Thus, Pavlidis does not disclose whatsoever measuring a blush or the use of spectral reflections including subdermal hydration to determine if a subject is blushing.

Further, Pavlidis teaches away from using human skin reflections, by stating expressly that "abrupt temperature changes in localized regions can be detected by human face emissions" (see at least Col. 5, lines 25-30 and Col. 6, lines 1-6). Specifically, Pavlidis teaches the onset of anxiety and the detection of a transition into an anxiety state "with suitable monitoring of emissions from the individual 30" (see at least Col. 5, lines 25-30 and Col. 6, lines 1-6).

In view of the above discussion, as Pavlidis does not teach or suggest at least every element of Applicants' Claims 1 and 12, Applicants respectfully submit that independent Claims 1, and 12 are patentable and in condition for allowance. In

addition, as Claims 2-11, and 14-22 depend from either independent Claims 1 or 12, Applicants respectfully submit that these claims are also patentable and in condition for allowance.

Reconsideration and withdrawal of these rejections are respectfully requested.

### **REJECTION UNDER 35 U.S.C. § 103**

Claims 3, 9, 11, 14, 20, 22-25, and 27 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Pavlidis in view of Elli Angelopoulou (*The Reflectance Spectrum of Human Skin*; hereinafter "Angelopoulou"). Claims 5 and 16 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Pavlidis in view of Kataoka (*Development of a Skin Temperature Measuring System for Non-contact Stress Evaluation*; hereinafter "Kataoka"). These rejections are respectfully traversed.

Independent Claim 23 had been amended to recite:

indicating whether the subject is experiencing physiological stress based on an attenuation at a pre-selected frequency of a light spectrum reflected from the first and the second areas of skin, the attenuation being representative of a change in a reflected spectrum indicating a sub-dermal blood flow and a spectrum of dermal hydration, and the attenuation indicating a blush (emphasis added).

Applicants submit these features as claimed are not taught, disclosed or suggested by Pavlidis, Angelopoulou or Kataoka, either alone or in combination. Further, Applicants respectfully submit it would be improper to modify Pavlidis with Angelopoulou or Kataoka.

Applicants respectfully refer the Examiner to the remarks regarding Claims 1 and 12 for a discussion of the Pavlidis reference. With regard to Angelopoulou, it is improper

to modify Pavlidis with Angelopoulou as Angelopoulou expressly deals with human skin reflections and not human skin emissions. Thus, these two references take basically opposite approaches to detecting stress in an individual. There is further nothing in either of these references that would suggest or motivate one skilled in the art to combine the teachings of each in the manner done by the Examiner. There is further nothing in these references that would suggest the desirability of combining the features in the manner done by the Examiner.

With regards to Kataoka, Kataoka discloses the use of an infrared camera to measure the temperature emitted from a subject (see Page 942, Column 1). Kataoka further does not teach or disclose whatsoever the use of spectral reflection to determine physiological stress; rather Kataoka deals with measuring the temperature of a person's skin emitted after being exposed to stimulus.

As neither Pavlidis, Angelopoulou nor Kataoka teach or suggest Applicants' invention as claimed, Applicants respectfully submit that independent Claim 23 is patentable and in condition for allowance. In addition, as Claims 25-27 depend from independent Claim 23, Applicants respectfully submit that these claims are also patentable and in condition for allowance.

Reconsideration and withdrawal of these rejections are respectfully requested.

#### **NEW CLAIM**

New Claim 29 has been added. Applicants assert that this claim does not fall into a separate classification system nor will it require a separate field of search.

Further, Applicants respectfully assert that new Claim 29 is allowable. With regard to independent Claim 29, independent Claim 29 includes:

a first reflectance spectrum when the subject is unstressed, or

a second reflectance spectrum when the subject is stressed, the second reflectance spectrum differing from the first spectral reflection of light because of sub-dermal blood flow and a spectrum of dermal hydration in the subject as the subject experiences stress; and

comparing the obtained spectral reflection of light that comprises the image with a base line reflectance spectrum to determine if the spectral reflection of light more closely matches the first or second reflectance spectrums, to thus determine if the subject is stressed or unstressed (emphasis added).

As none of the cited references teach or suggest at least these features as claimed, as discussed above, Claim 29 should be patentable and in condition for allowance. Prompt and favorable consideration of this claim is respectfully requested.


### **CONCLUSION**

It is believed that all of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot. Applicant therefore respectfully requests that the Examiner reconsider and withdraw all presently outstanding rejections. It is believed that a full and complete response has been made to the outstanding Office Action and the present application is in condition for allowance. Thus, prompt and favorable consideration of this amendment is respectfully requested. If the Examiner

believes that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at (248) 641-1600.

Respectfully submitted,

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